

The pages are fairly well supplied with footnotes pointing out sources in which fuller detail of development can be seen, or drawing attention to certain special features of transformations that are worthy of particular attention by the practitioner.

On the whole, the volume is an unusually practicable summary for workers in trigonometry, is singularly free from typographical errors, and is printed in type of such size and variety as to enable the eye to catch readily the particular thing the reader may want. As a ready reference handbook it leaves little to be desired.

G. W. MYERS.

*Beispiel-Sammlung zur Arithmetik und Algebra.* Von Dr. Hermann Schubert, Professor an der Gelehrtenschule des Johanneums in Hamburg. Dritte, durchgesehene Auflage. Leipzig, G. J. Göschen'sche Verlagshandlung, 1905. 136 pp.

THIS is one of the little 80-pfennige handbooks of the well-known Sammlung-Göschen. On 120 pages, 3 inches by 4 inches, it contains 1275 exercises and problems, formal and clothed (eingekleidet), covering the following topics: the transition from calculation to arithmetic, modes of calculating of the first order, of the second order, applications of these modes, quadratics, modes of calculating of the third order, an appendix of problems on higher arithmetic, and selected results.

The appendix contains, in the language of problems: observations on building arithmetic systematically, arithmetic and geometric series, compound interest and annuities, the binomial theorem, Moivre's theorem, and cubic equations.

The problems are arranged in a developmental order, according to the German idea of development. In mathematics the German notion, as shown by their text-book literature, seems to be to begin a topic with a large number of formal and easy exercises, to pass by easy gradations to and through more complicated problems, still of the formal type, and, lastly, to give a list of carefully graded verbal problems having a real content. This accords with the views of some American writers on high school mathematics.

In the view of other writers in our own country and in England, we should get on much better if pupils were not first mechanized by the formal problems. These writers favor fewer of the formal type of problem, and a much larger pro-

portion than is customary of the clothed (eingekleidet) type, the formal exercises to be put at the end of the treatment of topics, to develop mechanical skill, after a larger amount of practice is had in the translation of verbal into formal language. For a considerable time a necessary part of the solution of every problem would be the setting up of the necessary equations. The former mode seeks technique first, then undertakes to infuse thinking into a formal frame-work. The latter seeks to secure the thinking first, and then to develop the technique *as a means of facilitating*, not result-finding, but *thought*. In the reviewer's opinion this collection errs in the over-stressing of the formal side of algebra at the beginning of developments of topics. Of course, teachers may select problems in whatever order they choose. But these lists have evidently been prepared for the special service of teachers whose practice is "through the art to the science."

In this compilation the formal problems outnumber the clothed, or verbal, about in the ratio of 3 to 1. The verbal problems are taken from physical science, from geometry, from elementary mechanics, and from the customary topics of arithmetic. A very large percentage of them are of real modern interest. Any teacher of high school algebra will find this manual a valuable source from which to select exercises to replace many of the dead ones of the standard texts. In this day of correlated algebra and geometry it will be a great help to learn, as these lists of problems show, how many types and varieties of algebraic equations may be based on geometric relations. The chief value of the book for American high school teaching is its adaptability to this service. Many teachers will be glad to find so practical a means as such problems afford of holding the ground made in algebra during the first high school year while the second-year geometry is being taught.

G. W. MYERS.

*An Elementary Treatise on Pure Geometry.* By J. W. RUSSELL, M.A. Oxford, The Clarendon Press, 1905. xii + 366 pp.

THIS is the second edition of a work in which "the author has attempted to bring together all the well-known theorems and examples connected with harmonics, anharmonics, involution, projection (including homology), and reciprocation" (preface to first edition, line 1). In other words, it is con-